

WHAT IS CLAIMED IS:

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1. A film lamination method for laminating a film on a principal surface of a semiconductor substrate by using a rotatable roller having a heat-generating part therein, the film  
10 lamination method comprising:

pressing the roller onto the film placed on the principal surface of the semiconductor substrate while generating heat by the heat-generating part; and

15 rolling the roller on the film so as to laminate the film on the semiconductor substrate by heat from the heat-generating part.

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2. The film lamination method as claimed in claim 1, wherein said roller includes a cylindrical metal body and a resin layer formed on  
25 an outer surface of the cylindrical metal member, and wherein the heat-generating part is provided in a central portion of the cylindrical metal member so as to extend in an axial direction of the cylindrical metal member.

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3. The film lamination method as claimed  
35 in claim 2, wherein said resin layer is formed of a fluoride resin.

4. The film lamination method as claimed  
in claim 1, wherein said roller is a cylindrical  
elastic member, and a plurality of heat-generating  
parts are arranged near an outer surface of the  
5 cylindrical elastic member.

10 5. The film lamination method as claimed  
in claim 4, wherein said cylindrical elastic member  
is made of rubber or plastic.

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6. The film lamination method as claimed  
in claim 1, wherein said roller includes a plurality  
of short rollers each having a width smaller than a  
20 width of said semiconductor substrate so that the  
film is laminated on the semiconductor substrate by  
pressing the plurality of short rollers sequentially  
on the film placed on the principal surface of the  
semiconductor substrate and rolling the short  
25 rollers on the film.

30 7. A film lamination method for  
laminating a film on a principal surface of a  
semiconductor substrate by using a table supporting  
the semiconductor substrate and a rotatable roller,  
the table having a plurality of heat-generating  
35 parts therein, the film lamination method comprising  
pressing the roller onto the film placed on the  
principal surface of the semiconductor substrate and

rolling the roller on the film while selectively  
activating the heat-generating parts in response to  
a movement of the roller so as to laminate the film  
on the semiconductor substrate by heat from the  
5 heat-generating parts.

10 8. The film lamination method as claimed  
in claim 7, wherein said heat-generating parts are  
arranged so as to be parallel to a direction  
perpendicular to a laminating direction and  
thermally isolated from each other.

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9. A film lamination method for  
20 laminating a film on a principal surface of a  
semiconductor substrate by using a rotatable roller  
and a table supporting the semiconductor substrate,  
a heat-generating part being movably provided under  
the table, the film lamination method comprising  
25 pressing the roller onto the film placed on the  
principal surface of the semiconductor substrate and  
rolling the roller on the film while moving the  
heat-generating part in response to a movement of  
the roller so as to laminate the film on the  
30 semiconductor substrate by heat from the heat-  
generating part.

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10. A film lamination apparatus  
comprising:

a table on which a semiconductor substrate to be processed is placed and fixed; and

a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film,

wherein said roller includes:

a cylindrical metal member;

a heat-generating part provided in the cylindrical metal member; and

a resin layer covering an outer surface of said cylindrical metal member.

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11. A film lamination apparatus comprising:

a table on which a semiconductor substrate to be processed is placed and fixed; and

a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film,

wherein said roller includes:

a cylindrical elastic member; and

a heat-generating part provided in the cylindrical elastic member.

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12. A film lamination apparatus comprising:

a table on which a semiconductor substrate to be processed is placed and fixed; and

a roller assembly having a plurality of short rollers each pressing an attachment film onto the semiconductor substrate while rolling on the

attachment film,

wherein said roller assembly includes a plurality of heat-generating rods parallel to a direction perpendicular to a laminating direction, the heat-generating rods provided with cylindrical metal members, respectively, so that parts of the cylindrical metal members overlap with each other in an axial direction of the heat-generating rods.

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13. A film lamination apparatus comprising:

a table on which a semiconductor substrate to be processed is placed and fixed;

a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film; and

a heat-generating part provided in said table, wherein the heat-generating part is divided into a plurality of small heat-generating parts arranged in a direction of movement of the roller.

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14. A film lamination apparatus comprising:

a table on which a semiconductor substrate to be processed is placed and fixed;

a roller pressing an attachment film onto the semiconductor substrate while rolling on the attachment film; and

a heat-generating part provided under said table, the heat-generating part being movable in response to a movement of said roller.

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15. A manufacturing method of a semiconductor device, comprising the steps of:  
grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate;

applying an attachment film onto the another principal surface of the semiconductor substrate; and

individualizing the semiconductor substrate into a plurality of semiconductor elements, wherein the attachment film is laminated on the semiconductor substrate by pressing the attachment film placed on the another principal surface of the semiconductor substrate by a rotatable roller having a heat-generating part therein and rolling the roller on the attachment film while generating heat by the heat-generating part.

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16. A manufacturing method of a semiconductor device, comprising the steps of:

grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate;

applying an attachment film onto the another principal surface of the semiconductor substrate; and

individualizing the semiconductor substrate into a plurality of semiconductor elements, wherein the attachment film is laminated on the semiconductor substrate by pressing by a rotatable roller the attachment film placed on the another principal surface of the semiconductor substrate that is placed on a table provided with a

plurality of heat-generating parts therein and rolling the roller on the attachment film while selectively causing the heat-generating parts to generate heat in response to a movement of the roller.

10           17. A manufacturing method of a semiconductor device, comprising the steps of:  
              grinding another principal surface of the semiconductor substrate so as to thin the semiconductor substrate;  
15           applying an attachment film onto the another principal surface of the semiconductor substrate; and  
              individualizing the semiconductor substrate into a plurality of semiconductor elements,  
20           wherein the attachment film is laminated on the semiconductor substrate by pressing by a rotatable roller the attachment film placed on the another principal surface of the semiconductor substrate that is placed on a table for supporting  
25           the semiconductor substrate and rolling the roller on the attachment film while moving a heat-generating part provided under the table in response to a movement of the roller, the heat-generating part generating heat while moving.

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